

IN THE CLAIMS

1. (currently amended) An isolated polarizing optical beam splitter/combiner capable of operating as a combiner for combining orthogonally polarized beams of light into a single port in a combining direction, and capable of operating as a splitter ~~or~~ for splitting a beam of light into orthogonally polarized beams of light to spatially separated ports in a splitting direction comprising:

a first port for launching a beam of light into the splitter/combiner when operating as a splitter, and ~~or~~ for outputting a combined beam of light from the splitter/combiner when operating as a combiner;

second and third spaced apart ports for launching orthogonally polarized beams of light into the splitter/combiner for combining and outputting the first port when operating as a combiner, and ~~or~~ for outputting orthogonally polarized beams of light, which were input together at the first port, when operating as a splitter;

a first polarization beam splitter optically coupled to the first port, oriented to provide different optical paths for two orthogonally polarized beams of light;

a second polarization dependent beam steering means optically coupled to the second and third ports, oriented to provide different optical paths for two orthogonally polarized beams of light;

a non-reciprocal rotator between the first polarization beam splitter element and at least an element of the second polarization dependent beam steering means for rotating a polarization of each of two orthogonal beams of light and maintaining the orthogonal relationship between them when passing therethrough in one direction, while having substantially no cumulative effect on the polarization of the two orthogonal beams

of light when passing in an opposite direction, said non-reciprocal rotator adapted to be driven for transmission in a selected combining direction or a splitting direction,

wherein, when operating as a combiner and driven in the combining direction, the non-reciprocal rotator permits light to propagate from the second and third ports simultaneously to the first port, and prevents light from coupling from ~~between~~ the first port to and the second and third ports, and ~~or~~

wherein, when operating as a splitter and driven in the splitting direction, the non-reciprocal rotator permits light to propagate from the first port simultaneously to the second and third ports, and prevents light from coupling from the ~~between~~ second and third ports to and the first port.

2. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 1, wherein the first polarization beam splitter element and the second polarization dependent beam steering means comprise a first and a second birefringent element.

3. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 2, wherein the first and second birefringent elements are located in object space or image space.

4. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 3, wherein the non-reciprocal rotator comprises a Faraday rotator.

5. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 4, wherein the non-reciprocal rotator further comprises a half wave plate.

6. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 5, wherein the non-reciprocal rotator provides a rotation of zero degrees in a selected direction and provides a rotation of 90 degrees in a reverse direction.
7. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 6, wherein the first birefringent element and the second birefringent element have rotational axes oriented substantially parallel or antiparallel to each other.
8. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 7, wherein at least one of the first birefringent element and the second birefringent element has an axis oriented for maximum walk-off between the different optical paths.
9. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 4, wherein the first birefringent element and the second birefringent element have rotational axes oriented at substantially 45 degrees to each other and the Faraday rotator provides a rotation of 45 degrees.
10. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 4, wherein the first birefringent element and the second birefringent element have rotational axes which together with a rotation of the non-reciprocal rotator provide efficient coupling in a transmission direction between the different optical paths of the first birefringent element and the different optical paths of the

second birefringent element while substantially preventing coupling in an isolation direction.

11. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 3, wherein the non-reciprocal rotator includes at least a pair of aspherical lenses for collimating beams from the first birefringent element to the rotator and for focusing the beams for launching into the second birefringent element.

12. (original) An isolated polarizing optical beam splitter/combiner as defined in claim 3, wherein the first birefringent element has an o-ray path and an e-ray path and the second birefringent element has an e-ray path and an o-ray path such that the e-ray path of the second birefringent element is optically coupled with the o-ray path of the first birefringent element and the o-ray path of the second birefringent element is optically coupled with the e-ray path of the first birefringent element, wherein the different optical paths for two orthogonally polarized beams of light passing through both the first and second birefringent elements have a substantially same optical path length.

13. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 12, wherein the first and the second birefringent elements are substantially of a same optical length.

14. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 12, further comprising a third birefringent element and a second non-reciprocal rotator between the second birefringent element and the third

birefringent element.

15. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 14, wherein one of the first, second and third birefringent elements has an optical length equal to a total optical length of the other two of the first, second and third birefringent elements.

16. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 1, wherein the first polarization beam splitter element comprises a birefringent beam splitter element, and the second polarization dependent beam steering means comprises a pair of birefringent elements having parallel wedge surfaces.

17. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 16, wherein the non-reciprocal rotator is disposed between the pair of birefringent elements.

18. (previously presented) The isolated polarizing optical beam splitter/combiner as defined in claim 17, wherein the second and third ports are symmetrically disposed about an axis of an input lens for launching orthogonally polarized collimated beams at equal and opposite angles into a first of the pair of birefringent elements and for receiving orthogonally polarized focused beams.

19. (previously presented) The isolated polarizing optical beam splitter/combiner as defined in claim 18, further comprising a lens optically coupled to the first port for collimating a beam of light launched into the splitter/combiner or for focusing a

combined beam of light output from the splitter/combiner.

20. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 19, wherein each birefringent element of the pair of birefringent elements has an optical axis disposed orthogonally to the other.

21. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 20, wherein the non-reciprocal rotator comprises a Faraday rotator and a half wave plate arranged to provide a zero degree rotation in a transmission direction and a 90 degree rotation in an isolation direction.

22. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 19, wherein each birefringent element of the pair of birefringent elements has an optical axis disposed parallel to the other.

23. (original) The isolated polarizing optical beam splitter/combiner as defined in claim 22, wherein the non-reciprocal rotator comprises a Faraday rotator and a half wave plate arranged to provide a 90 degree rotation in a transmission direction and a zero degree rotation in an isolation direction.

24. canceled

25. canceled

26. canceled

27. canceled

28. (new) An isolated polarizing optical beam splitter for splitting a beam of light into orthogonally polarized beams of light to spatially separated ports in a splitting direction comprising:

- a first port for launching a beam of light into the splitter;

- second and third spaced apart ports for outputting first and second orthogonally polarized sub-beams of light, respectively, which were input together at the first port;

- a first polarization beam splitter optically coupled to the first port, for directing the first and second sub-beams along different optical paths;

- a second polarization beam splitter optically coupled to the second and third ports, for directing the first and second sub-beams to the second and third ports, respectively; and

- a non-reciprocal rotator between the first polarization beam splitter and at least an element of the second polarization beam splitter for rotating the polarization of each of the first and second sub-beams of light and maintaining the orthogonal relationship between them when passing therethrough in one direction, while having substantially no cumulative effect on the polarization of the first and second sub-beams when passing in an opposite direction;

- wherein the non-reciprocal rotator permits the first and second sub-beams to propagate from the first port simultaneously to the second and third ports, and prevents light from coupling from the second and third ports to the first port.

29. (new) The beam splitter according to claim 28, wherein the first polarization beam splitter has an o-ray path and an e-ray path, and the second polarization beam splitter has an e-ray path

and an o-ray path; wherein the e-ray path of the second polarization beam splitter is optically coupled with the o-ray path of the first polarization beam splitter, and the o-ray path of the second birefringent element is optically coupled with the e-ray path of the first birefringent element; and wherein the different optical paths for the first and second sub-beams passing through both the first and second polarization beam splitters have substantially a same optical path length.

30. (new) The beam splitter according to claim 28, wherein the non-reciprocal rotator comprises a Faraday rotator and a half wave plate arranged to provide a 90° rotation in a one direction and a 0° degree rotation in an opposite direction.

31. (new) An isolated polarizing optical beam combiner for combining first and second orthogonally polarized sub-beams of light into a combined beam of light comprising:

- a first port for outputting the combined beam of light;
- second and third spaced apart ports for inputting the first and second orthogonally polarized sub-beams of light, respectively;

- a first polarization beam splitter optically coupled to the first port, for directing the first and second sub-beams along different optical paths to the first port;

- a second polarization beam splitter optically coupled to the second and third ports, for directing the first and second sub-beams along different optical paths; and

- a non-reciprocal rotator between the first polarization beam splitter and at least an element of the second polarization beam splitter for rotating the polarization of each of the first and second sub-beams of light and maintaining the orthogonal relationship between them when passing therethrough in one

direction, while having substantially no cumulative effect on the polarization of the first and second sub-beams when passing in an opposite direction;

wherein the non-reciprocal rotator permits the first and second sub-beams to propagate to the first port simultaneously from the second and third ports, and prevents light from coupling from the first port to the second and third ports.